

REMARKS

Claims 1-10 and 19-21 are pending in this application. Claims 13-18 have been canceled as being drawn to a non-elected invention. Claim 11 has been canceled in this Amendment and claim 1 has been amended to incorporate the limitations of former Claim 11. Claim 1 has also been amended to recite that the polymer functionalization layer is “composed and configured to alter the electrical properties of the at least one nanotube from n-type to p-type response to gate voltage, so as to permit sensing the target species by a sensing signal including current flowing through the conduction path under the influence of at least one selected gate voltage during exposure to the target species.” New Claim 21 has been added.

The amendments to Claim 1 and new Claim 21 are supported by the specification, among other places, at Page 5, line 21 through Page 6, line 27, and FIGS. 3-6

Rejection Under 35 U.S.C. § 103

Claims 1-8, 11, 19 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,258,020 to Dai et al. (“Dai”) in view of U.S. Patent No. 6,111,280 to Gardner (“Gardner”). Claims 9 and 10 are rejected as being unpatentable over Dai in view of Gardner and further in view of other references.

Claim 1 has been amended to recite a gate electrode configured to apply a selectable voltage to influence the conductivity of the carbon nanotube nanostructure. The claim has also been amended to recite that the polymer functionalization layer on the nanostructure is

“composed and configured to alter the electrical properties of the at least one nanotube from n-type to p-type response to gate voltage, so as to permit sensing the target species by a sensing signal including current flowing through the conduction path under the influence of at least one selected gate voltage during exposure to the target species.”

As described in the specification, semiconducting nanotubes exhibit p-type FET characteristics. The polymer functionalization layer described by applicants’ Claim 1 alters the properties so that the resulting device exhibits properties of an n-type FET. This feature is not

taught or suggested by Dai or Gardner. Compare FIG. 4A with FIG. 4B of Applicants' specification: FIG. 4A shows decreasing conductance of the uncoated device as the gate voltage increases (n-type FET), whereas FIG. 4B shows that the conductance of a device having a polymer layer as recited in Applicants' claims increases with the increase of gate voltage (p-type FET). Conversion of the device to from an n-type to a p-type FET allows sensing of the target species by current flowing through the conduction path.

At least because a polymer functionalization layer composed and configured to alter the device's properties as recited by the claims is neither taught nor suggested by Dai or Gardner, either alone or in combination, Applicants submit that Claim 1 and its dependent claims are patentable over the cited art.

Conclusion:

In light of the foregoing amendments and remarks, Applicants respectfully submit that all pending claims are now in condition for allowance. Thus, Applicants respectfully request a Notice of Allowance from the Examiner. Should any unresolved issues remain, the Examiner is encouraged to contact the undersigned at the telephone number provided below. If the Commissioner determines that any additional fee is due, such fee may be charged to deposit account No. 500388 (Order No. NANOP002).

Respectfully submitted,
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